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FOUR NEW SPECIES OF CONIFER FEEDING APHIDS

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The conifer Aphids described herewith were taken in the Pacific Northwest. Two of the new species are named after their collectors, Dr. Louis G. Gentner, and Mr. Joe Schuh, both of Oregon, in appreciation of their efforts in adding to the Aphid fauna of their state.

Cinara gentneri n. sp.

Apterous viviparous female.

Length and general color.—Length from vertex to end of anal plate of cleared specimens varying from 5.55-5.77 mm. Color probably quite similar to color of oviparous female, recorded, by Dr. Gentner as light yellowish-brown.

Head and thorax.—Length of antennal segments as follows: III .825-.975mm., IV .45-.53mm., V .555-.63mm., VI .27-.30 + .09mm. Third antennal segment without sensoria, sensoria on fourth segment variable, sometimes with only primary, which is normal in size and position, sometimes without primary and with 1-3 small secondary sensoria, sometimes with only one large sensorium, but this removed from the end of segment. Fifth antennal segment with narrow rimmed, large primary sensorium, and one comparatively large secondary sensorium. Primary sensorium on sixth antennal segment tuberculate, marginal sensoria on this segment arranged in an irregular row, and as a rule six in number. Hair on antennae numerous, almost upstanding, fine, sharp pointed, on third segment varying from .07-.09mm. in length, slightly longer than width of segment, the ratio of length to width of segment being 6-5. Hairs on sixth antennal segment longer than width of segment, rather droopy, extending to base of primary sensorium. Second antennal segment with numerous hairs, the hairs covering all of the surface, hair on first antennal segment limited to apical half of segment, more numerous than usual. Median transverse suture variable, as a rule absent, at times represented by an extremely short line, only rarely is it complete, and when so very indistinct.

Rostrum when extended reaching to or slightly beyond genital plate, in one case exceeding length of body. Last three segments of the rostrum with following lengths: .42, .38 and .10mm. Compound eyes small, round, ocular tubercles present, but so small that they have to be looked for. Median mesosternal tubercle absent. Length of prothoracic femora varying from 1.50-1.65mm. Length of metathoracic femora varying from 1.84-2.17mm. Length of metathoracic tibiae vary-

ing from 2.82-3.07mm. Length of first and second metathoracic tarsal segments .15 and .45mm. Hair on metathoracic tibiae numerous, fine, tapering to a long fine point, more numerous on inner margin but not so long or upstanding, as on the outer margin where they are about .10mm. in length. On the outer margin the hairs are set at an angle of more than sixty degrees near middle and basal regions of segment, and slightly less towards the apex. Ventral surface of first tarsal segment with about fourteen hairs. Hairs on ventral surface of second tarsal segment more numerous and shorter than those on dorsal surface. Union of first and second tarsal segments about equal to width of second segment, or to length of dorsal surface of first tarsal segment.

Abdomen.—Dorsal and ventral surfaces of abdomen with numerous hairs, which are similar on both surfaces as to length and coarseness. These hairs are similar to those found on the cornicles. Dorsum of abdomen without pigment spots, except for the two transverse spots anterior to the cauda which have from two to three rows of coarse hairs on their posterior margins. These spots are provided with very poorly developed setulae. Directly anterior to the transverse pigmented spots the abdomen is almost free from hairs, but the region between them has several hairs similar to the hairs found on them.

These hairs are much coarser than those on the dorsum of the body. Dorsum of abdomen with about four rows of very small wax pore plates. Cornicles with outer margin very irregular, often with small clear areas. Anterior portion of cornicles extended forward, giving them a longer axis than their width, this anterior projection of the cornicle is very irregular, and has several clear areas. Hairs on cornicles of one kind, about .15mm. in length, on outer margin where the hairs are fewer, the hairs are more numerous and slightly shorter on cone. Genital plate very large, unusually deep, with a narrow notch located in the median region of the anterior and posterior surfaces. Median posterior region of genital plate free from hairs. Hairs on lateral regions very coarse, much longer than hairs located in median region. Surface of genital plate indistinctly covered with setulae. Cauda and anal plate provided with numerous long coarse hairs.

Oviparous female.

Dr. Gentner sent me living specimens. They arrived dead but nevertheless in a life like condition, so that color notes could be made. Head thorax and abdomen dusky dark brown. Pits on pro and mesothoracic segments slightly pruinose. Anterior and posterior margins of prothorax yellowish. Abdomen dusky dark-brown. Cornicles brown, but much darker than abdomen. Antennae and legs brown, with the ends of segments dusky.

Size and lengths of antennal segments, and legs within range of similar structures of the apterous viviparous female. Hind tibiae with almost no swelling, most unusual in the presence of only a meager number of sensoria, which are widely scattered, small, non tuberculate, and three to six in number. Other structures as in apterous viviparous female.

Holotype, apterous viviparous female. Morphotype, oviparous female. Both deposited in the United States National Museum. Host, *Abies grandis.* Union Creek, Jackson Co., Oregon. Holotype taken Sept. 21,

1956. Morphotype taken Oct. 15, 1956. Collected by Louis G. Gentner.

Specimens of this species key, in Palmer's key to the genus *Cinara*, in "Aphids of the Rocky Mountain Region" to *Cinara curvipes* (P), a species from which it differs in almost all respects except those made use of in the key. To enumerate, the unguis is nail-like, the color is brown not black, the hairs on the antennae, legs, and cornicles differ, none of the hairs are ever dull at the apex, those on the tibiae are upstanding, the antennae are not imbricated, the cornicles have many more hairs, the hind tibiae are not so bent, the antennae have many more hairs. This species may be differentiated at once from *C. kiusa* to which it is closely allied by the very large, and deep genital plate.

Cinara kiusa n. sp.

Apterous viviparous female.

Length from vertex to end of anal plate of cleared specimens varying from 3.25-3.67mm. Color in life not recorded. Head and thorax dusky brown. Abdomen free from pigmented spots. Cornicles dusky brown. First antennal segment concolorous with head. Second antennal segment slightly lighter in color than first segment. Remaining anennal segments pale dusky with apical portions of segments brownish. Color of all femora much the same, medium dusky brown, with the extreme apex, almost black. Basal portion of tibiae deep brown, followed by dusky brown, which becomes deeper brown beyond middle, and continues thus to apex. Tarsal segments brown shaded with black.

Head and thorax.—Antennal segments with the following lengths; III .825-915mm., IV .42-535mm., V .525-.575mm., VI .24-.25 + .09mm. Third antennal segment without sensoria, fourth segment with only primary sensorium, fifth segments with one secondary sensorium and primary. Hair on antennae numerous, upstanding, on third segment, varying from slightly less than width of segment to equal to width, or about .10mm. Hair on sixth segment more numerous than usual, extending to mid region of primary sensorium, almost straight. Unguis distinctly nail-like. Second antennal segment with numerous hairs, hair on first segment confined to apical half. Median transverse suture indistinct, narrow, rather pale in color. Hairs on vertex and dorsum of head numerous, fine, about .11mm. long. Eyes comparatively small, ocular tubercles small, difficult to differentiate. Rostrum when extended reaching slightly beyond the cornicles. Last three segments of the rostrum measuring .42, .40, and .15mm. Length of prothoracic femora varying from 1.42-1.65mm. Metathoracic femora varying from 1.95-1.975mm. Metathoracic tibiae varying from 3.18-3.30mm. Length of metathoracic tarsal segments .15 and .43mm. Hair on femora numerous, fine, upstanding, distributed over entire surface, about .045mm. in length on metathoracic femora. Hair on tibiae fine, sharp-pointed, numerous, much shorter than width of segment, varying in length from .05-0.75mm. in length. The hair on the outer margin are slightly longer, and more upstanding, than the hair on the inner margin. The hairs near the apex of the tibiae are more numerous, and less upstanding than the hairs closer to the base. Hairs on ventral surface of the first tarsal segment very difficult to count, probably about twenty. Hairs on ventral surface of the second segment more numerous, and

shorter than the hairs on the dorsal surface. Mesosternal tubercle absent.

Abdomen.—Hairs on dorsal and ventral surface of the abdomen similar, the hairs are numerous on both surfaces, and similar to the hairs on the cornicles. Lateral dorsal surface of abdomen with two rows of small wax pore plates. Transverse pigmented areas anterior to cauda with very irregular inner margins, surface covered with short fine setulae, arranged in transverse rows. Posterior margin of pigmented areas with two to three rows of long coarse hairs, similar hairs are located between the pigmented areas. Cornicles with width through outer margin varying from 3.25-.375mm. Outer margin quite regular, except for a very slight forward extension. Genital plate narrow, broadly excavated posteriorly, free from hairs except for lateral portions. Setulae well developed. Cauda and anal plate with numerous hairs, both structures with well developed setulae.

This species is closely allied to *Cinara gentneri* differing in smaller size, color of legs and antennae, cornicles with fewer rows of hairs, forward extension of cornicles less and different lengths of antennal segments. The two species may be differentiated at once by observing the genital plates. The genital plate of *gentneri* is very deep, is indented on both the anterior and posterior margins, and has many more hairs. The genital plate of *kiusa* is narrow, has the hairs limited to the lateral posterior portions of the plate.

Holotype, apterous viviparous female, deposited in the United States National Museum. Host, *Abies Concolor.* Coll. M. J. Buckhorn, August 15, 1930.

Cinara schuhi n. sp.

Alate viviparous female.

Length from vertex to end of anal plate varying from 2.10-3.25mm. Color in life not recorded, remembered by Mr. Schuh as, "light brown." Color of cleared specimens as follows: Antennal segments brown, quite uniform in color, except for the extreme base of the third segment which is pale. Head and thorax dark brown. All femora with basal area pale, remainder deep brown. Pro and metathoracic tibiae uniform brownish black, or almost so, mesothoracic tibiae not quite so dark, dusky brown with ends of segment darker. Tarsal segments concolorous with ends of tibiae. Cornicles brown. Dorsum of abdomen free from pigmented spots, except for transverse pigmented areas anterior to cauda.

Head and thorax.—Length of antennal segments as follows: III ,22-.24mm., IV .255-.285mm., VI .13-.15 + .03-.05mm. Sensoria distributed as follows: III eight-ten plus primary. The secondary sensoria are very large, and arranged in a straight row, all sensoria on this segment have wide rims. IV one-three secondary sensoria, plus primary, the secondary sensoria are arranged in a straight row, have wide rims, but are not as large as those on the third segment. V one secondary sensorium plus primary. Fourth, fifth and sixth antennal segments lightly imbricated, the imbrications being best developed on the sixth. Antennal hair moderately numerous, fine, sharp-pointed, about .08mm. in length, longer than width of segment, the ratio of length to width

being 5-3. The hairs are more numerous on the anterior margin, than on posterior margin, and are set at an angle of forty-five degrees or more, no hairs upstanding. Hairs on sixth segment extending to primary sensorium. Marginal sensoria close to primary sensorium, more or less in a row. Second antennal segment with ends free from hairs, the hairs on this segment being limited to the mid region. First antennal segment with few hairs, the hairs being in one or two rows beyond middle. Rostrum extending to cornicles, last three segments with the following lengths: .19, .15, .08mm. Median transverse suture narrow, dark. Hairs on anterior margin of head about .08mm. in length. Eyes small, round, ocular tubercles difficult to differentiate. Media twice forked, second fork closer to margin than to first fork. Lateral lobes of thorax with hairs covering all but extreme lateral portions. Median posterior lobe of thorax with few hairs. Metathoracic femora varying in length from 1.52-1.77mm. provided with fine sharp-pointed hairs, which are slightly more numerous on the anterior margin than on the posterior margin, also slightly longer, being about .09mm. in length. Metathoracic tibiae varying from 2.55-3.07mm. Hairs on tibiae numerous, fine, sharp-pointed, set at an angle of about forty-five degrees, or less, varying in length from .105-.11mm. longer than width of segment, the ratio of length to width being 7-6 or 8-6. Hair on inner margin of hind tibiae slightly shorter than hair on outer, also more numerous. First tarsal segment with about 18 hairs on ventral surface, the union of this segment with the second segment is no wider than the width of the second segment. Hair on dorsal surface of second tarsal segment, longer and fewer than the hairs on the ventral surface. Length of first metatarsal segment .13mm. length of second tarsal segment .30mm.

Abdomen.—Hairs on ventral surface of abdomen much more numerous than the hairs on dorsum, only one half as long. Hairs on dorsum of abdomen fine, about .10mm. in length. Dorsum of abdomen with exceedingly short and fine setulae. The setulae are arranged in transverse rows, the rows are very close together. Cornicles with outer margins quite regular in outline, width of cornicles varying from .30-.35mm. Hairs on cornicles covering entire surface, similar to those on dorsum of abdomen. Transverse pigmented spots anterior to cauda very narrow, far apart, provided with two rows of hairs on posterior margin. Cauda and anal plate with setulae. Hair on cauda for most part limited to posterior margin. Genital plate slightly excavated posteriorly, provided with few hairs, confined largely to ends.

Apterous viviparous female.

Length from vertex to end of anal plate varying from 2.55-2.85mm. Color most likely brown. Legs and antennae not quite so dark as in the alate. Length of antennal segments as follows: III .48-.50mm., IV .20-.21mm., V .225-.27mm., VI .12-.13 + .04. Sensoria distributed as follows: III 1-5 plus primary, IV 1 secondary plus primary, V similar to fourth. The secondary sensoria are large, round, with wide rims, and on the third segment confined to apical portion of segment. Primary sensoria large, with wire rims. Hairs on antennae similar to those on antennae of alate, but slightly longer. Sixth antennal segment weakly imbricated. Median transverse suture distinctly brown. Ocular tubercles small. Mesosternal tubercle small. Metathoracic femora vary-

ing in length from 1.275-1.50mm. Metathoracic tibiae varying in length from 2.25-2.40mm. Metatarsal segments .105 and .225mm. Hairs on metathoracic tibiae varying from .09-105mm. in length on outer margin, slightly less on inner margin, numerous on both surfaces.

Cornicles varying from .30-.375mm. Outer margin of cornicles uneven. Hairs on cornicles on entire surface, similar to the hairs on the dorsum. Hairs on dorsum of abdomen, much more numerous than the hairs on the dorsum of the abdomen in the alate, about .105mm. in length. Hairs on ventral surface of the abdomen very numerous. Transverse pigmented spots anterior to cauda very narrow provided with an irregular row of long hairs on the posterior margin. Hairs on cauda confined largely to posterior margin. Holotype, alate viviparous female, Morphotype apterous viviparous female. Both mounted on the same slide, which has been deposited in the United States National Museum. Host *Abies concolor.* August 12, 1956, Bly, Oregon. Coll. Joe Schuh.

This species keys to couplet 29 in Palmer's key to the genus Cinara, in Aphids of the Rocky Mountain Region. The fourth segment of the rostrum is not longer than .25mm. but hind tarsal two is more than .28mm. The species is not *C. murrayanae.* The sensoria on third antennal segment suggest *C. curtihirsuta* H & E but the hairs on the antennae and tibiae are too long, and much too numerous. The hairs on the dorsum of the abodmen are too long, and there are more numerous hairs on the cornicles.

Cinara moketa n. sp.

Apterous viviparous female.

Length from vertex to end of anal plate 3.60mm. Color in life not recorded. Cleared specimens with head, pro and mesothorax very dark dusky brown. Anterior portion of metathorax with four mid dorsal patches of brown, which are in turn surrounded by small irregular shaped dusky spots. Mid dorsal region of abdomen posterior to cornicles with four irregular shaped spots of brown. Lateral regions of dorsum of abdomen with two rows of small wax pore plates. Transverse pigmented spots anterior to cauda with ends irregular, far apart. First two antennal segments concolorous with head, third and fourth antennal segments pale with ends brown, sixth segment uniform brown. Femora with basal portions pale, shading to brown at the apex. Pro and mesothoracic tibiae with short distance near base brown, this is followed by a yellowish region which shades gradually to brown at the apex. Metathoracic tibiae with brown at apex more extensive, and the pale region much shorter. Tarsal segments concolorous with ends of tibiae. Cornicles brown. Cauda and anal plate brown with outer margins almost black.

Head and thorax.—Width of head through the eyes .75mm. Hairs on anterior margin of head .11mm. in length. Antennal segments with the following lengths: III .45mm., IV .16mm., V .23mm., VI .10 + .04mm. Third and fourth antennal segments with only primary sensoria. Fifth antennal segment with one secondary and primary sensoria. Sixth antennal segment and a portion of the fifth weakly imbricated. Hair on antennae fairly numerous, those on anterior margin more numerous

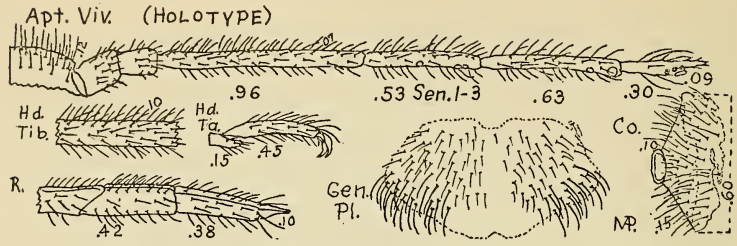
than those on posterior margin, about .10-.12mm. in length. Eyes large with well developed ocular tubercles. Both margins of femora with numerous long fine sharp pointed hairs. Length of prothoracic femora .84mm. Length of mesothoracic femora .755mm. Length of metathoracic femora 1.305mm. Lengths of pro, meso and metathoracic tibiae 1.245, 1.425, and 2.25mm. Hairs on metathoracic tibiae numerous, hairs on basal third almost upstanding, remaining hairs about sixty degrees at middle of segment to about forty-five degrees near apex. Hairs on outer margin longer and slightly more coarse than the hairs on the inner margin, also slightly more numerous. Hairs on outer margin not all of the same length, the distinctly shorter hairs are slightly more droopy than the long hairs, the two lengths of hair are intermixed. Length of first metatarsal segment .13mm. ventral surface of this segment with about twelve hairs. Length of second metatarsal segment .27mm. hairs on ventral surface of this segment shorter than those on the dorsal surface, where the hairs are slightly less than two times the width of the segment in length. Union of first and second trasal segments not wider than width of second segment at point of union. Mesosternal tubercle absent.

Abdomen.—Hairs on dorsum of abdomen distinctly finer and longer and fewer than hairs on ventral surface. Length of hairs on the dorusm .15mm. Length of hairs on the venter .105mm. The hairs on the dorsum arise from small pigmented tubercles. Cornicles with outer margin quite regular. Width of cornicles .48mm. Constricted portion of cornicles with numerous hairs, region near margin with distinctly fewer hairs.

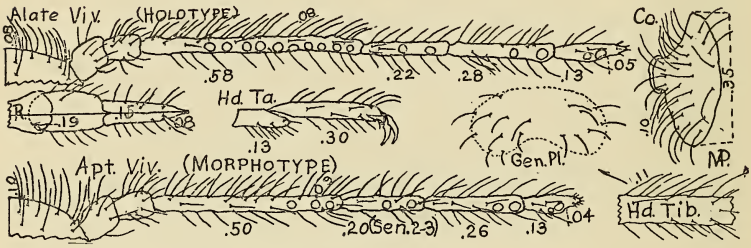
Transverse pigmented spots with two rows of hairs on the posterior margin. Dorsum of abdomen very finely reticulated, but without setulae. Cauda and anal plate with blackish setulae, cauda with median posterior tubercle, not always distinct. Hair on cauda and anal plate confined largely to posterior margin. Genital plate somewhat bent in the form of a crescent with the ends blunt and irregular. Hairs on genital plate confined to ends of crescent.

This species is allied to *C. hirsuta* H & E, and may be quickly differentiated from that species by the absence of the almost square mesosternal tubercle. The antennal segments are shorter, as are the tibiae, and the hair on the tibiae, the hair on the cornicles are not as extensive, and distinctly fewer hairs on the transverse pigmented spots. In Palmer's key to the genus *Cinara* in Aphids of the Rocky Mountain Region this species keys to *C. pinea* (Mord.), but not without difficulty because of couplet 27 which makes no allowance for hairs of two lengths and different angles. This species differs from *pinea* in many ways, the antennae are shorter, as are the tarsal segments, the hair on the tibiae are not of the same quality, and the cornicles are larger.

Holotype, apterous viviparous female, deposited in the United States National Museum. Host, *Pinus lambertiana*, Placerville, California March 16, 1939. Coll. J. S. Yuill.



Cinara gentneri n. sp.



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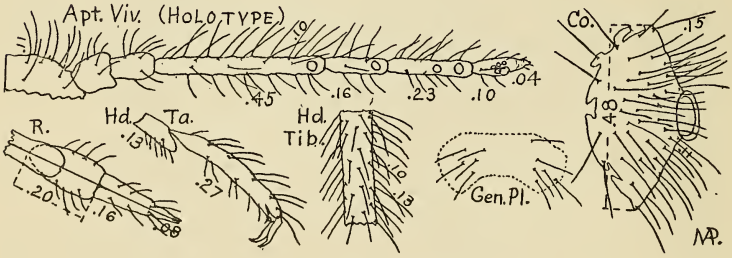
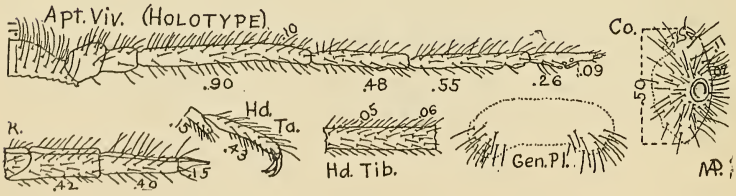


Cinara moketa n. sp.



Cinara kiusa n. sp.